Frame

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Safety

The purpose of this safety summary is twofold. First, it is to help ensure the safety and health of individuals performing service and maintenance on, or operation of, this Blue Bird product. Second, it is to help ensure protection of equipment. Before performing any service, maintenance or operating procedure on this product, individuals should read and adhere to the applicable warnings, cautions and notes located throughout this Blue Bird Service Manual.

Warnings

Warnings apply to a procedure or practice that, if not correctly adhered to, could result in injury or death. Particular attention should be paid to sections of this manual where warnings appear.

Cautions

Cautions apply to a procedure or practice that, if not correctly adhered to, could result in damage to or destruction of equipment.

Notes

Notes are used to explain, clarify, or otherwise give additional insight for a given subject, product or procedure. Please note that on occasion, notes too may advise of potential safety issues.

Introduction

These procedures were documented using a Blue Bird All American bus with a Cummins ISB engine and an Allison AT 545 transmission. Vehicles with other engines or transmissions will use similar procedures. For variations, refer to the appropriate installation drawing.

Warning

Use the parking brake. Use wheel chocks at the rear wheel. Always ensure the vehicle is stable before moving under the vehicle.

Preparatory Work

Park the vehicle on a level surface. If a lift is available, much of the under vehicle work would be easier. Once parked, set the parking brake and chock the rear wheels.

Configuration Details

All applications are common except:

- Hendrickson Air Front Suspension
- Jackknife door
- Spring suspension
- Extended front bumper
- Extended rear bumper

Description of Operation Forward Engine

When a huckspin is removed, replace with the proper capscrew and a lock nut. **Table 1—Huckspin to Capscrew Conversion.**

Caution

Make sure that a flat washer and a lock nut are used with capscrew replacing the huckspin.

Frame Components Forward Engine

See **Figure 1—Frame Configuration with Spring Suspension Forward Engine**.

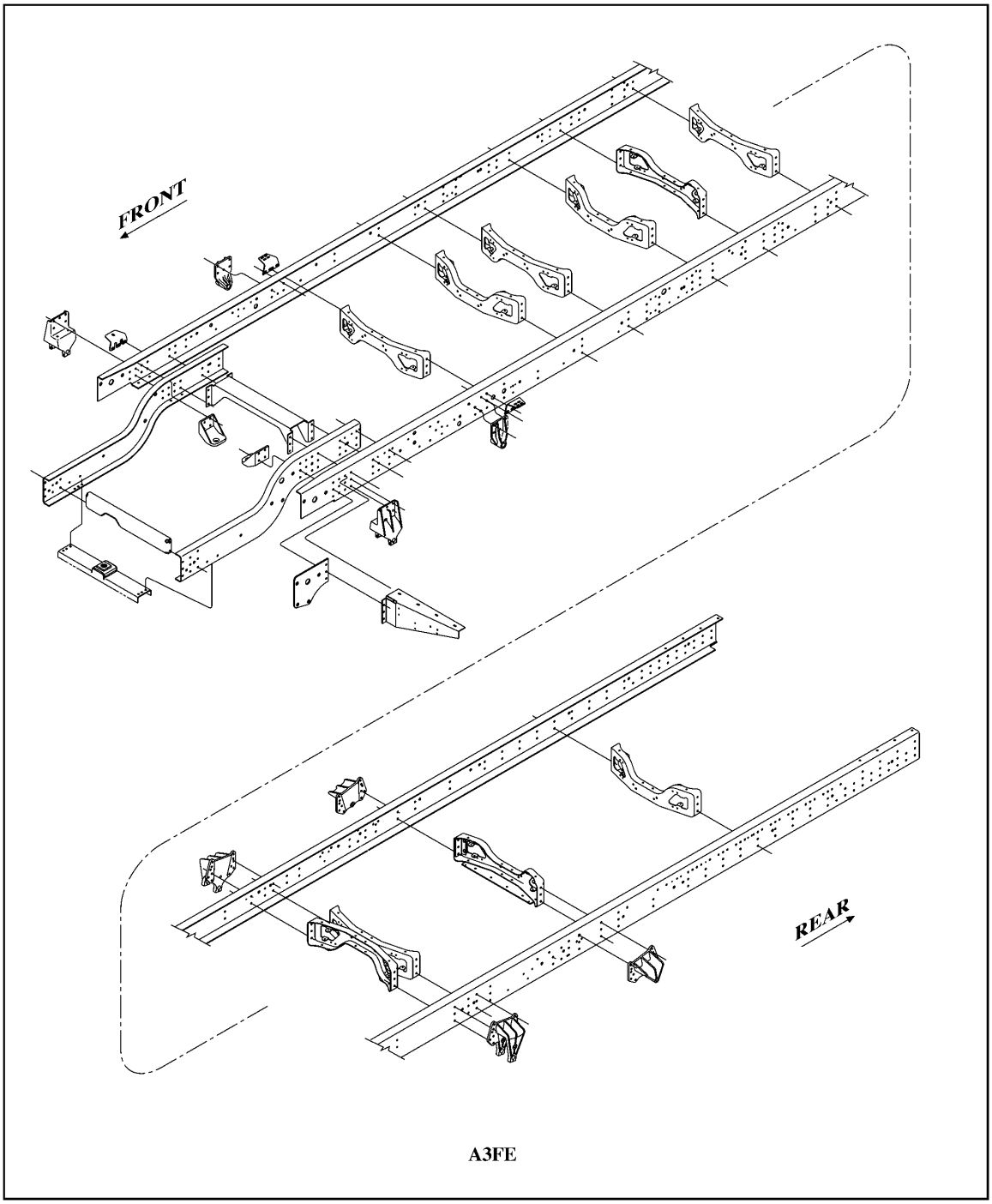

Figure 1—Frame Configuration with Spring Suspension Forward Engine

HUCKSPIN			GRIP RANGE		CAPSCREW GR8		
BB P/N	Huck Number	Nominal Length	Min	Max	Nominal Length	Thread	BB P/N
1636943	-10	2.25	0.43	0.90	1.50	½-13	0803239
1636943	-10	2.25	0.43	0.90	1.75	½-13	0803148
1636950	-16	2.60	0.85	1.25	1.75	½-13	0803148
1636943	-10	2.25	0.43	0.90	1.75	½-20	0959452
1636950	-16	2.60	0.85	1.25	1.75	½-20	0959452
1636950	-16	2.60	0.85	1.25	1.75	½-13	0803205
1746817	-20	2.85	1.09	1.50	2.00	½-13	0803205

CAPSCREW BOLTS THIS MATERIAL THICKNESS		BB P/N	USE FLAT WASHER	USE LOCKING NUT	USE NON-LOCKING NUT
Minimum	Maximum	---	---	---	---
0.25	0.75	0803239	1003045	0850800	½-20 GR8
0.50	1.00	0803148	---	---	---
0.50	1.00	0803148	---	---	---
0.50	1.00	0959452	---	---	---
0.50	1.00	0959452	---	---	---
0.75	1.25	0803205	---	---	---
0.75	1.25	0803205	---	---	---

Table 1—Capscrew to Huckspin Conversion

Front Bumper Removal Forward Engine

See **Figure 2—Front Bumper Forward Engine.**

Warning

Ensure that the weight of the bumper is supported at all times.

1. Remove nut (3), flat washer (2).
2. Remove bumper plate spacer (5) and bolt (1) from bracket (6).

Note

Procedure removes optional 2 inch extension (4), if so equipped.

Note

There are three standard spacers (5) on the Rear Engine model.

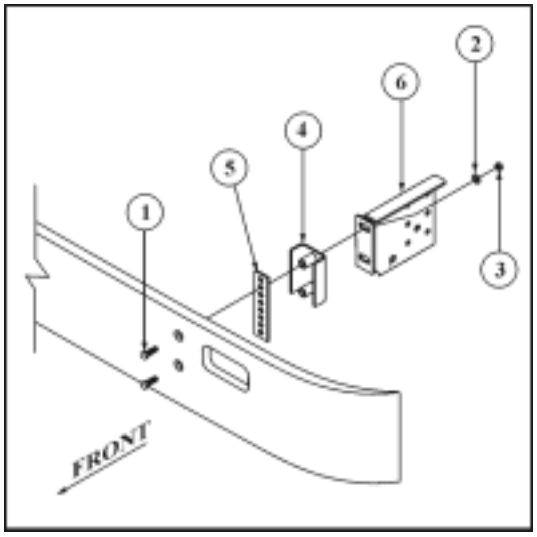

Figure 2—Front Bumper Forward Engine

3. To re-install bumper, reverse the above procedures.

Pivoting Front Bumper Removal

See **Figure 3—Front Bumper with Pivoting Feature Forward Engine,** if so equipped.

Warning

Ensure that the weight of the bumper is supported at all times.

1. Remove nut (5), flat washer (4).
2. Remove bumper plate spacer (2) and bolt (3) from bracket (9).

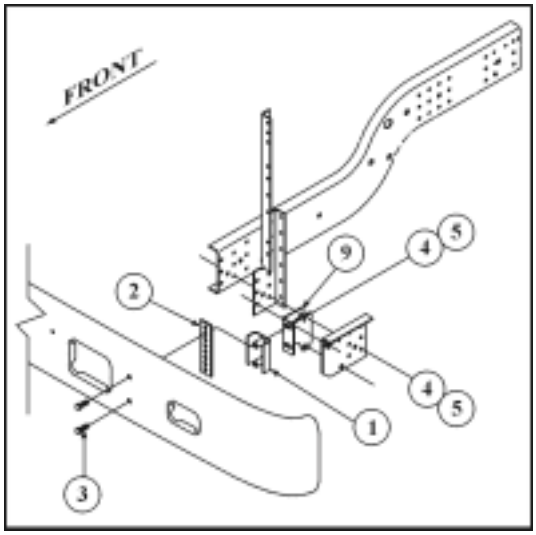

Figure 3—Front Bumper With Pivoting Feature Forward Engine

Note

Procedure removes optional 2 inch extension (1), if so equipped.

3. To re-install bumper reverse the above procedures.

Rear Bumper Removal

See **Figure 4—Rear Bumper Forward Engine.**

Warning

Ensure that the weight of the bumper is supported at all times.

1. Remove nut (8), flat washers (10), and capscrew (7) from side mount bumper brace.
2. Remove nuts (11), flat washers (10), lockwashers (12), and bolt (14) from rear bumper.
3. Remove the bumper.

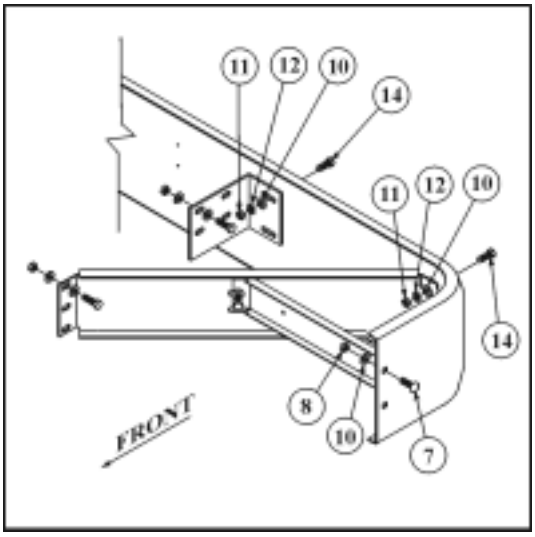

Figure 4—Rear Bumper Forward Engine

Note

If damage has occurred to bumper brackets, remove the brackets by similar process.

4. To re-install bumper reverse the above procedures.

Front Tow Hook Removal

See **Figure 5—Front Tow Hooks Forward Engine.**

1. Remove nuts (5), flat washers (4) and capscrews (3) from front bumper support bracket (2).

2. Remove pivot bracket (1) if equipped with pivoting bumper feature. **See Detail A,** Figure 5.
3. Remove tow hook.

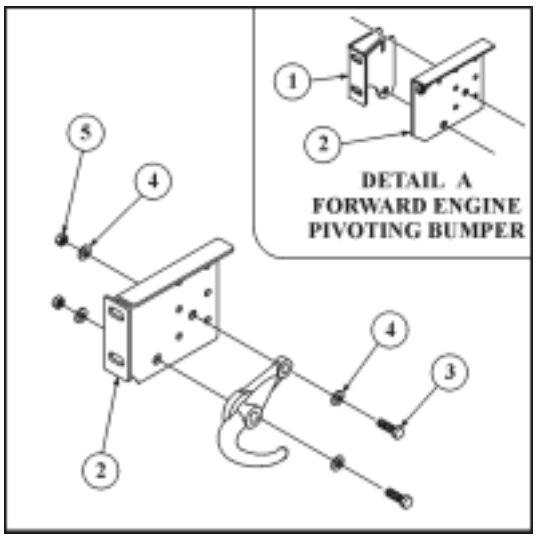

Figure 5—Front Tow Hooks Forward Engine

4. To re-install tow hooks reverse the above procedures.

Note

During installation, keep front and rear tow hooks pointed down.

Rear Tow Hook Removal

See **Figure 6—Rear Tow Hooks Forward Engine.**

1. Remove nuts (7), flat washers (5) and capscrews (6) from crossmember support bracket (3).
2. Remove tow hook.
3. To re-install tow hooks reverse the above procedures.

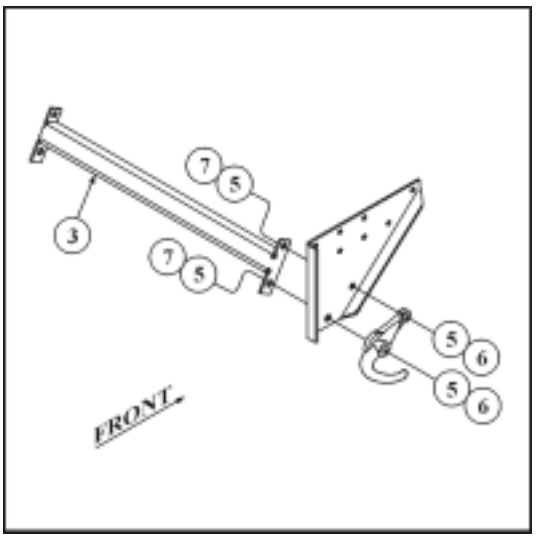

Figure 6—Rear Tow Hooks Forward Engine

Note

During installation, keep front and rear tow hooks pointed down.

Description of Operation Rear Engine

When a huckspin is removed, replace with the proper capscrew and a lock nut. Refer to **Table 1—Huckspin to Capscrew Conversion**.

Caution

Make sure that a flat washer and a lock nut are used with capscrew replacing the huckspin.

Frame Components Rear Engine

See **Figure 7—Frame Configuration with Spring Suspension Rear Engine**.

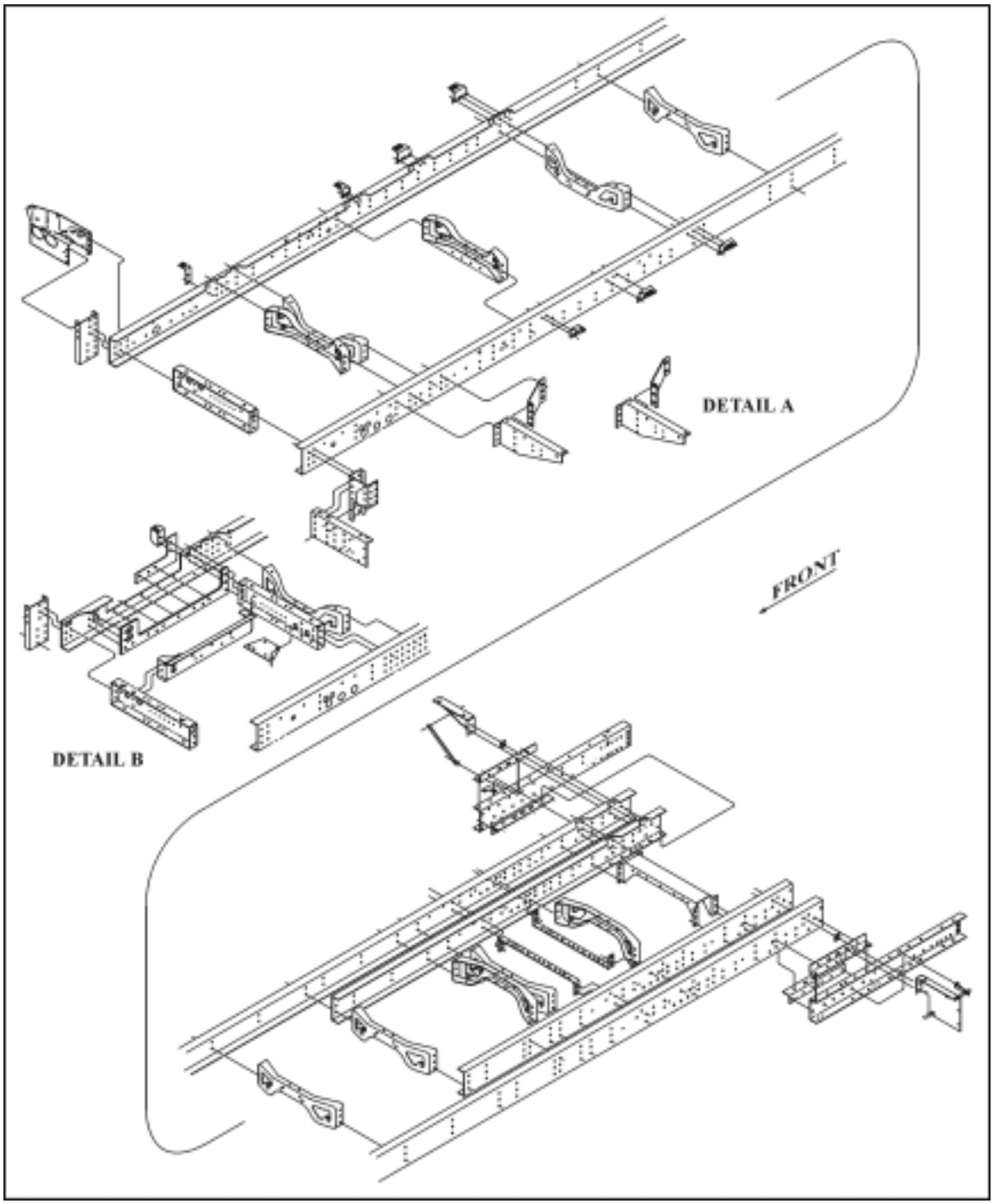

Figure 7—Frame Configuration With Spring Suspension Rear Engine

Front Bumper Removal Rear Engine

See **Front Bumper Removal Forward Engine.**

Rear Bumper Removal

See **Figure 8—Rear Bumper RE**.

Warning

Ensure that the weight of the bumper is supported at all times.

1. Remove nut (8), flat washers (7), and capscrew (19) from rear bumper brace mounting (5).
2. Remove nuts (8), flat washers (7), and bolts (16) from side mount bracket (11).
3. Remove nuts (8), flat washers (7), and capscrews (19) from rear bumper brace mounting brackets (4).

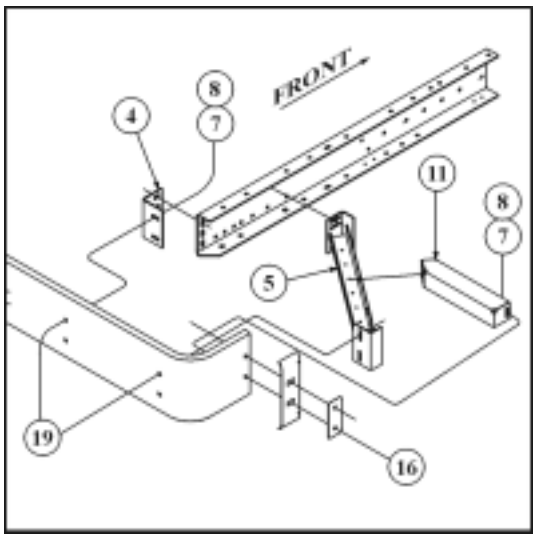

Figure 8—Rear Bumper Rear Engine

Note

If damage has occurred to bumper brackets, remove the brackets by similar process.

4. To re-install bumper reverse the above procedures.

Front Tow Hook Removal

See **Figure 9—Front Tow Hook Rear Engine**.

1. Remove nut (5), flat washer (4) and capscrew (3) from front bumper support bracket and tow hook.
2. Remove nut (8), flat washer (7) and capscrew (6) from crossmember support and tow hook.

Note

Capscrew (6) bolts through the forward most hole of the crossmember only.

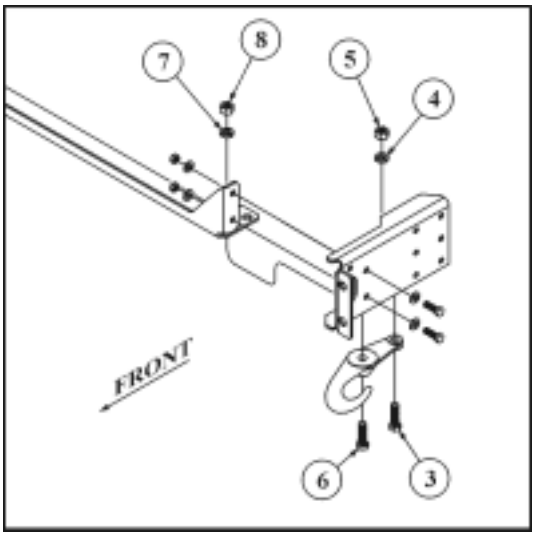

Figure 9—Front Tow Hook Rear Engine

3. To re-install tow hooks reverse the above procedures.

Note

During installation, keep front and rear two hooks pointed down.

Rear Tow Hook Removal

See **Figure 10—Rear Tow Hook Rear Engine.**

1. Remove nuts (5), flat washers (4), and capscrews (6) from rear tow hooks.
2. Remove tow hooks.

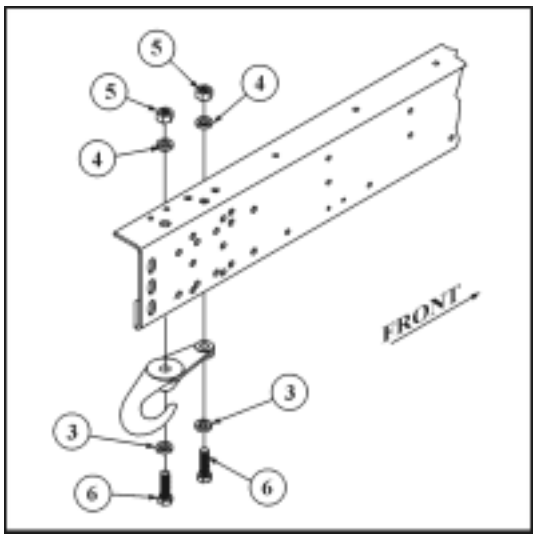

Figure 10—Rear Tow Hook Rear Engine

3. To re-install tow hooks reverse the above procedures.

Note
During installation, keep front and rear two hooks pointed down.

Frame Repair Preparatory Work

Note
Before welding, disconnect battery cables. If welding is near battery, remove battery.

Caution
Do not remove any chassis cross member. Do not weld on the engine, radiator, fuel tank, transmission or any component mounted on the engine or transmission.

Caution
Stabilize the bus with chocks and jacks.

1. Disconnect grounding cables.
2. Attach welding grounding cable no more than two-feet from the point of weld.
3. Provide shielding to protect chassis components from heat damage and welding splatters.
4. After welding, reconnect all ground cables, ECUs and other disconnected components.
5. Only a current AWS-certified welder should weld.

Frame Repair

1. Remove the affected fasteners.

Caution
Frame insert must be 950X HSLA steel or equivalent.

All ½-inch fasteners should be new coarse thread bolts, hardened washers (one under head and one under nut; new locking nuts). Ensure bolts and nuts are Grade 8 material.

2. Strip and clean the affected area, both sides of frame.
3. Locate the running tip of weld with magnifying glass.
4. Stop drill crack. Hole to be 1/8-inch diameter.

Note
Refer to Blue Bird drawing 1746155 for frame insert configuration.

5. Grind crack to 45-degree angle on one side and install 1/16-inch land on opposite side to ensure full penetration.
6. Grind the weld flush to base metal.
7. Install standard 9 5/8-inches rail to be 9.06-inches outside height with 2 ¾ flange and ¼-inch thick. Inside bend radius to be .37 to 0.50 inches.

Frame Welding

Warning

Remove all fuel from fuel tank(s) and fuel lines. Cover all hydraulic lines and electrical wires.

Weld procedure using mig (GMAW), see **Figure 11—Frame Weldment**.

- 0.35 diameter wire
- E70S3 AWS classification
- 300-350 inches per minute
- 90% Argon – 10% CO^2 or 92% Argon – 8% CO^2
- Arc Volts 18-21
- Amps 100-130
- Weld procedure using stick process (SMAW)
- E7018, E6012, or E6013 electrode, 1/8 to 5/16-inch electrode reverse polarity, ac or dc, adjust heat to thickness of material.

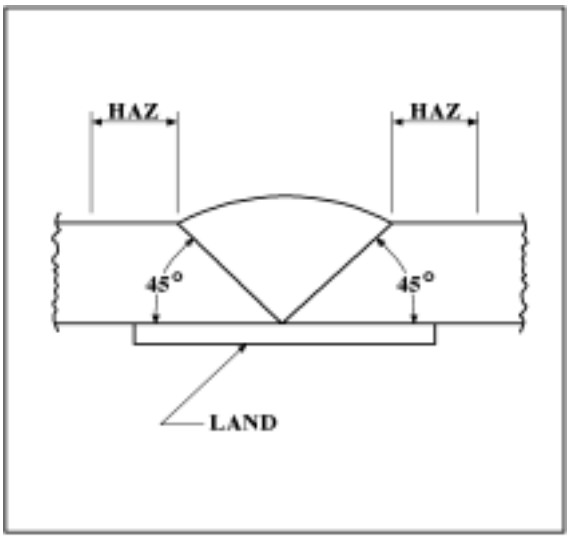

Figure 11—Frame Weldment

Caution

Make sure all slag has been removed before coating.

1. Clean area with wire brush.
2. Test drive bus and re-inspect weld area.
3. Coat area with the Blue Bird recommended coating.
4. Inspect weld area after 1,000 miles of service.

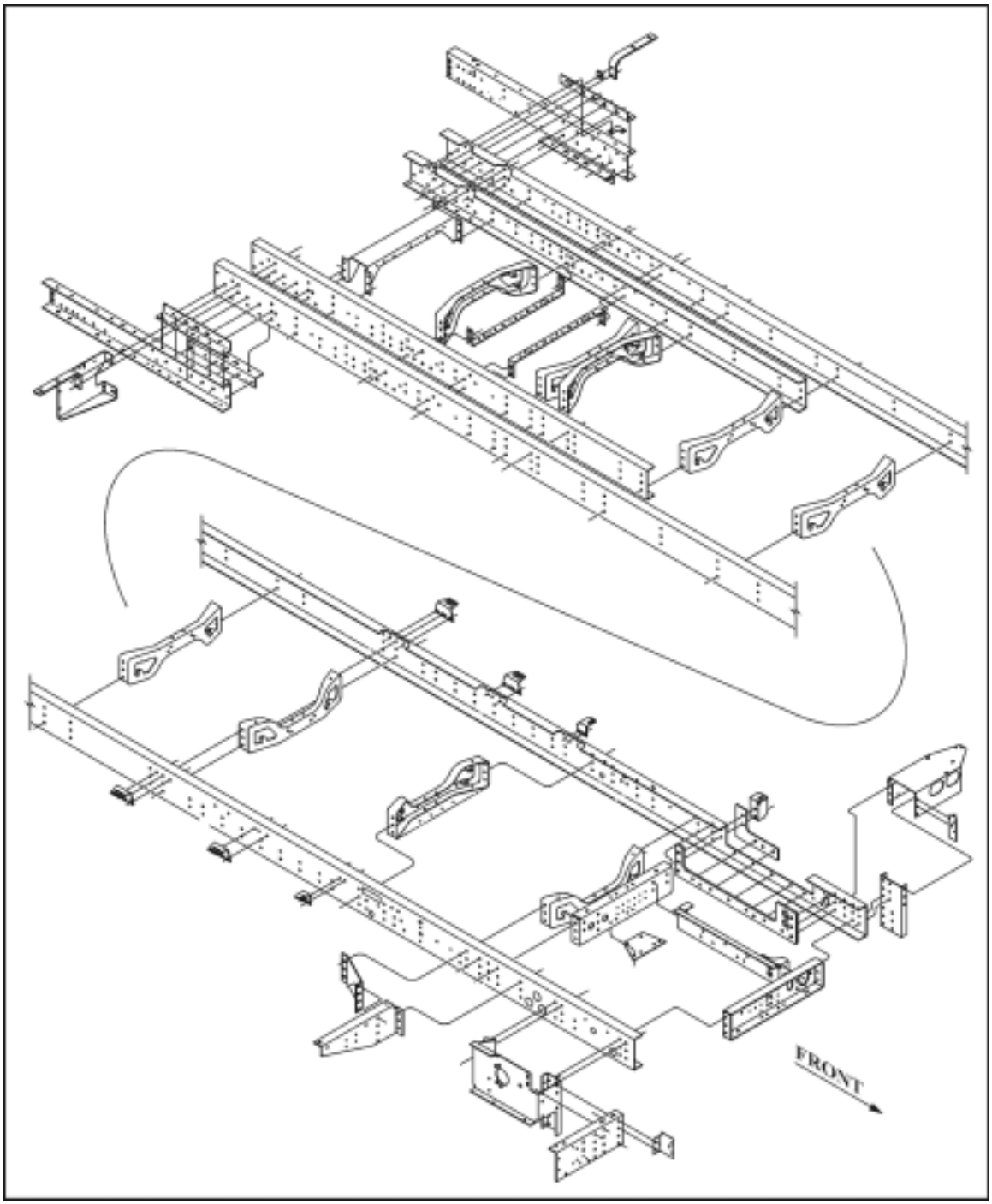

Figure 12—Right Hand Drive Frame Components

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